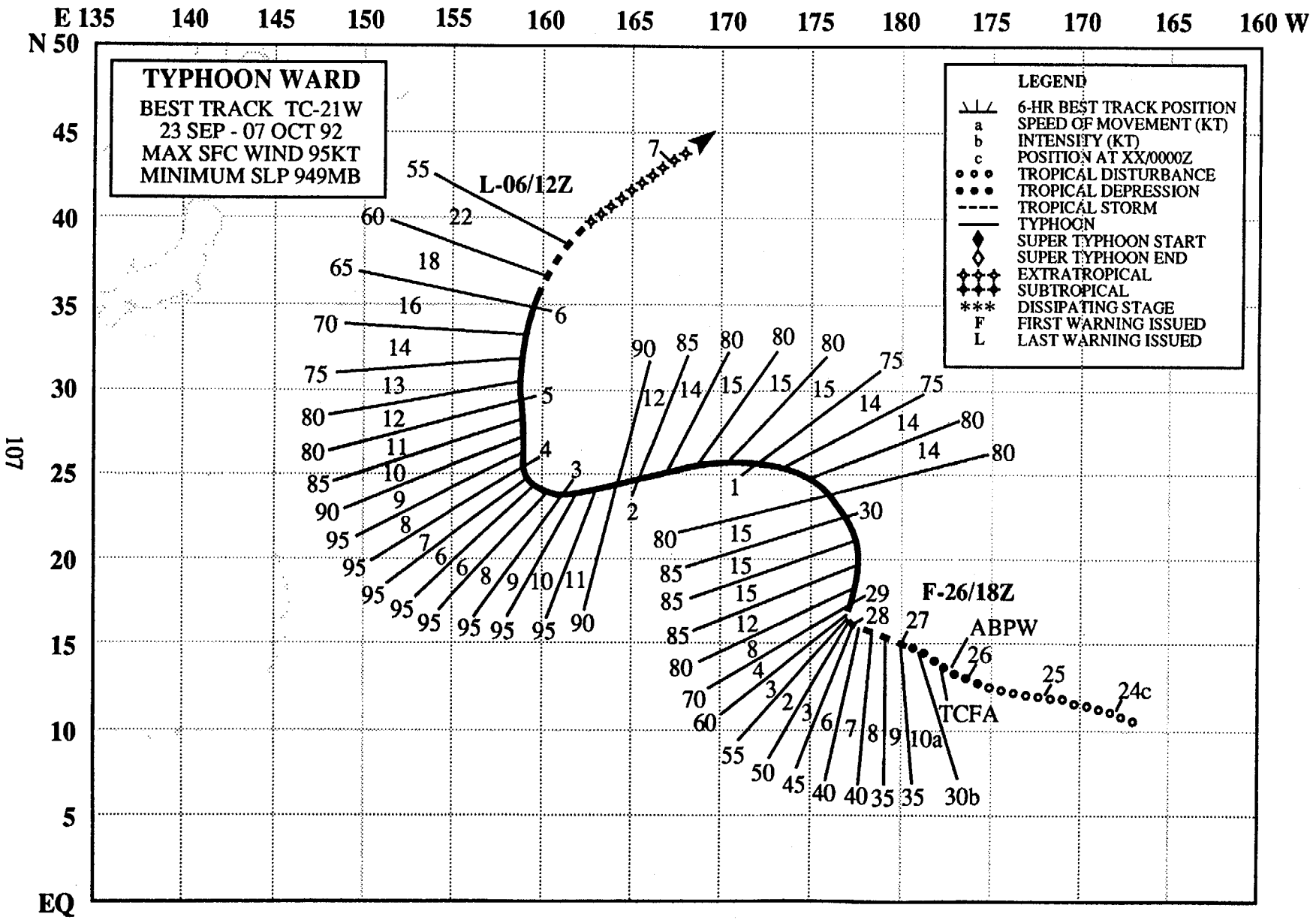
TYPHOON WARD
BEST TRACK TC-21W
23 SEP - 07 OCT 92
MAX SFC WIND 95KT
MINIMUM SLP 949MB
LEGEND
6-HR BEST TRACK POSITION
a SPEED OF MOVEMENT (KT)
b INTENSITY (KT)
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
L-06/12Z
F-26/18Z
ABPW
TCFA
E 135 140 145 150 155 160 165 170 175 180 175 170 165 160 W
N 50 45 40 35 30 25 20 15 10 5 EQ
107

TYPHOON WARD (21W)

I. HIGHLIGHTS

The last of five significant tropical cyclones to form in September, Ward was unusual in that it underwent two major track changes and two significant acceleration episodes. As a result, it presented considerable difficulty to JTWC forecasters. Ward remained over open ocean its entire life and only posed a threat to maritime interests.

II. TRACK and INTENSITY

Ward developed from a tropical disturbance that formed in the trade wind trough just to the east of the international date line. This disturbance was initially detected on 24 September when its persistent convection attracted the attention of satellite analysts collocated with JTWC. Even though the circulation was located east of the international date line, it was mentioned on the 260600Z September Significant Tropical Weather Advisory because it was anticipated to become a significant tropical cyclone as it crossed into JTWC's area of responsibility. At 261100Z, JTWC issued a Tropical Cyclone Formation Alert. Seven hours later, the first warning was issued at 261800Z, based on a satellite-derived intensity estimate of 30 kt (15 m/sec) and the presence of a well-defined low-level circulation center on the animated satellite imagery, near the area of deep convection. After being upgraded to a tropical storm, at 270000Z, Ward continued to track west-northwestward, gradually slowing down as it approached a weakness in the subtropical ridge which had developed in response to an approaching mid-tropospheric short-wave trough. On 28 September, the tropical storm turned sharply to the north and accelerated as the trough to the north swept past. Then, as the subtropical ridge strengthened to the north, Ward again made a sharp turn, this time to a more westward track. The appearance of a visible eye on 01 October indicated that the typhoon had begun to intensify a second time, reaching a maximum intensity of 95 kt (49 m/sec) at 021200Z. During the following 24 hours, the diameter of the eye expanded from 20 to 70 nm (37 to 130 km) (Figure 3-21-1).

On 5 October, a break in the subtropical ridge developed near 155°E longitude, allowing Ward to recurve and accelerate northward. Extratropical transition ensued on 6 October as the system moved over colder waters north of the Kuroshio current. JTWC issued its final warning at 061200Z.

III. FORECAST PERFORMANCE

Ward's track proved to be difficult for JTWC forecasters to predict. Changes in the strength and orientation of the subtropical ridge led to two abrupt track changes, a series of deceleration and acceleration episodes, and a wide, arcing path as Ward's heading backed 130° from north-northeastward to west-southwestward between 29 September and 01 October. Typically, such a complex track would lead to larger than normal forecast errors, and this case was no exception. JTWC's overall mean track errors were 120, 255 and 360 nm (220, 470 and 665 km) for 24-, 48- and 72-hour forecasts, respectively. These results on average were 15% better than those of CLIPER, which provides the performance baseline for demonstrating skill. The primary reason for JTWC's acceptable performance was the guidance provided by the NOGAPS model which for Ward was impressive. However, this was not really appreciated until after the fact, when the overall mean track error for NOGAPS guidance was tabulated. It showed that NOGAPS bettered JTWC track forecasts at all time intervals except 12-hour forecasts. At 72-hours, the overall mean track errors for NOGAPS were 40% lower than JTWCs.

Overall intensity forecast errors were average; however, for a 2-day period starting at 300600Z, the 72-hour intensity forecasts were low by 15 to 30 kt (8 to 15 m/sec), as anticipated vertical shear did not occur to arrest intensification.

IV. IMPACT

Because Ward remained over open ocean during its lifetime, it only threatened maritime interests. No reports of any damage or loss of life were received.

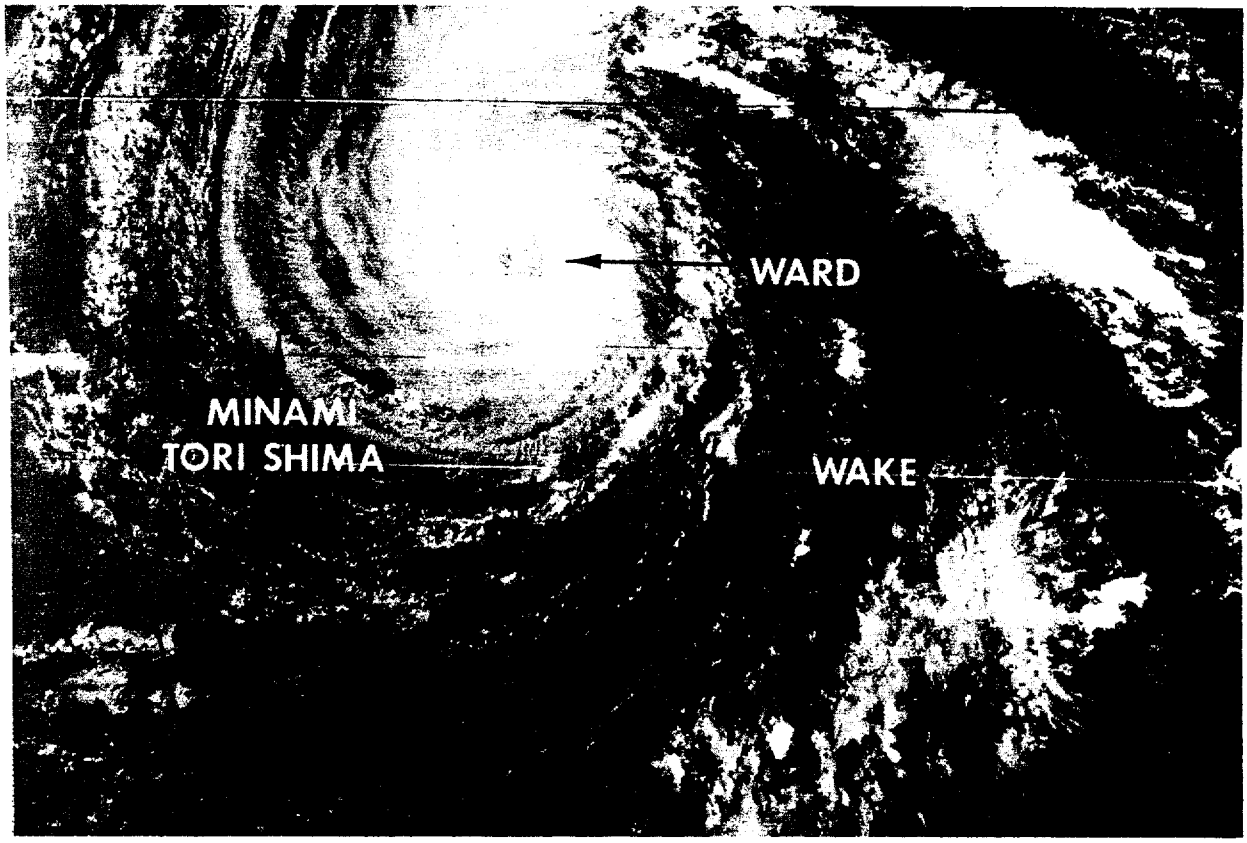

Figure 3-21-1. Ward's 55 nm (100 km) diameter eye is visible to the east of Minami Tori Shima (032232Z October DMSP visual imagery).